Author Index

ALT, M. (see SANDERS, I. R.), 419
ARVIEU, J. C. (see RIGOU, L.), 141
ASHENDEN, T. W., BELL, S. A. & RAFAREL, C. R., Responses of white clover to gaseous pollutants and acid mist: implications for setting critical levels and loads, 89
AYRES, P. G. (see HATCHER, P. E.), 239
BACK, E. (see SCHNEIDERBAUER, A.), 225
BALUŠKA, F., BARLOW, P. W., HAUSKRECHT, M., KUBICA, Š., PARKER, J. S. & VOLKMANN, D., Microtubule arrays in maize root cells. Interplay between the cytoskeleton, nuclear organization and post-mitotic cellular growth patterns, 177
BAMBRIDGE, L., MACLEOD, R. & HARMER, R., Plant growth and cell division in *Pisum sativum* L. and *Picea sitchensis* (Bong.) Carr. exposed to ozone, 75
BARLOW, P. W. (see BALUŠKA, F.), 177
BELL, S. A. (see ASHENDEN, T. W.), 89
BENDING, G. D. & READ, D. J., The structure and function of the vegetative mycelium of ectomycorrhizal plants. V. Foraging behaviour and translocation of nutrients from exploited litter, 401
——, READ, D. J., The structure and function of the vegetative mycelium of ectomycorrhizal plants. VI. Activities of nutrient mobilizing enzymes in birch litter colonized by *Paxillus involutus* (Fr.) Fr., 411
BENECH ARNOLD, R. L., FENNER, M. & EDWARDS, P. J., Influence of potassium nutrition on germinability, abscisic acid content and sensitivity of the embryo to abscisic acid in developing seeds of *Sorghum bicolor* (L.) Moench, 207
BERMADINGER-STABENTHEINER, E., Physical injury, re-crystallization of wax tubes and artefacts: identifying some causes of structural alteration to spruce needle wax, 67
BESFORD, R. T. (see VAN OOSTEN, J.-J.), 357
BLOM, C. W. P. M. (see CLEVERING, O. A.), 105
BOLLER, T. (see SANDERS, I. R.), 419
BONFANTE, P. & PEROTTO, S., Tansley Review No. 82 Strategies of arbuscular mycorrhizal fungi when infecting host plants, 3
BRECKLE, S.-W. (see REIMANN, C.), 37
CAIRNS, A. J., HOWARTH, C. J. & POLLOCK, C. J., Characterization of acid invertase from the snow mould *Monographella nivalis*: a mesophilic enzyme from a psychrophilic fungus, 391
CAMPBELL, F. S. (see CRITTENDEN, P. D.), 267
CAPE, J. N. & PERCY, K. E., Errata: *The New Phytologist* **125** (1993), 787–799, 157
CAPELLANO, A. (see SEQUERRA, J.), 545
CAVALIE, G. (see REUZEAU, C.), 59
CHAMBERS, F. M. (see MIGHALL, T. M.), 299
CHAMEL, A. (see VIOUGEAS, M. A.), 337
CLAPP, J. P., YOUNG, J. P. W., MERRYWEATHER, J. W. & FITTER, A. H., Diversity of fungal symbionts in arbuscular mycorrhizas from a natural community, 259
CLAUSTRES, J. P. (see DAUDET, F.-A.), 81
CLEVERING, O. A., VAN VIERSSEN, W. & BLOM, C. W. P. M., Growth, photosynthesis and carbohydrate utilization in submerged *Scirpus maritimus* L. during spring growth, 105
CLIFFORD, P. E., NEO, H. H. & HEW, C. S., Regulation of assimilate partitioning in flowering plants of the monopodial orchid *Aranda* Noorah Alsagoff, 381
CRITTENDEN, P. D., DAVID, J. C., HAWKSWORTH, D. L. & CAMPBELL, F. S., Attempted isolation and success in the culturing of a broad spectrum of lichen-forming and lichenicolous fungi, 267
DAUDET, F.-A. & CLAUSTRES, J. P., Continuous monitoring of gas exchange in open-top chambers in pollution experiments: methodological aspects, 81
DAVID, J. C. (see CRITTENDEN, P. D.), 267
DAVY, A. J. (see HOWLAND, D. E.), 117
DENNY, H. J. & RIDGE, I., Fungal slime and its role in the mycorrhizal amelioration of zinc toxicity to higher plants, 251
DIGGLE, P. J. (see WOLFENDEN, J.), 369
EDWARDS, P. J. (see BENECH ARNOLD, R. L.), 207
ERNST, D. (see SCHNEIDERBAUER, A.), 225
FENNER, M. (see BENECH ARNOLD, R. L.), 207
FITTER, A. (see MERRYWEATHER, J.), 467
FITTER, A. H. (see CLAPP, J. P.), 259
FRANCO, A. A. (see LOUREIRO, M. F.), 531
GAY, A. P. & THOMAS, H., Leaf development in *Lolium temulentum* L.: photosynthesis in relation to growth and senescence, 159
GIANINAZZI-PEARSON, V. (see SEQUERRA, J.), 545
GORDON, A. J., THOMAS, B. J. & JAMES, C. L., The location of sucrose synthase in root nodules of white clover, 523
GROPPE, K. (see SANDERS, I. R.), 419
HACKER, W. D. (see NEUFELD, H. S.), 447
HAGER, A. (see SIRRENBERG, A.), 149
HAMILTON, B. K. (see PATIL, B. S.), 349
HARMER, R. (see BAMBRIDGE, L.), 75
HARRISON, A. F. (see NEWBERY, R. M.), 565
HATCHER, P. E., AYRES, P. G. & PAUL, N. D., The effect of natural and simulated insect herbivory, and leaf age, on the process of infection of *Rumex crispus* L. and *R. obtusifolius* L. by *Uromyces rumicis* (Schum.) Wint., 239
HAUSKRECHT, M. (see BALUŠKA, F.), 177
HAWKSWORTH, D. L. (see CRITTENDEN, P. D.), 267
HEW, C. S. (see CLIFFORD, P. E.), 381
HILPERT, A. (see JESCHKE, W. D.), 23
HOLOPAINEN, J. K. (see KAINULAINEN, P.), 231
HOOKER, J. E. (see SEMPAVALAN, J.), 429
HOWARTH, C. J. (see CAIRNS, A. J.), 391
HOWLAND, D. E., OLIVER, R. P. & DAVY, A. J., Morphological and molecular variation in natural populations of *Betula*, 117
JACKSON, W. A. & VOLK, R. J., Attributes of the nitrogen uptake systems of maize (*Zea mays* L.): maximal suppression by exposure to both nitrate and ammonium, 327
JAMES, C. L. (see GORDON, A. J.), 523
JAMES, E. K. (see LOUREIRO, M. F.), 531
JESCHKE, W. D., KLAGGES, S., HILPERT, A., SAEED BHATTI, A. & SARWAR, G., Partitioning and flows of ions and nutrients in salt-treated plants of *Leptochloa fusca* L. Kunth. I. Cations and chloride, 23
KAINULAINEN, P., HOLOPAINEN, J. K. & OKSANEN, J., Effects of SO_2 on the concentrations of carbohydrates and secondary compounds in Scots pine (*Pinus sylvestris* L.) and Norway spruce (*Picea abies* (L.) Karst.) seedlings, 231
KLAGGES, S. (see JESCHKE, W. D.), 23
KUBICA, Š. (see BALUŠKA, F.), 177
LACK, A. J., Relationships and hybridization between British species of *Polygala* – evidence from isozymes, 217
LEE, E. H. (see NEUFELD, H. S.), 447
LILJEROTH, E., Comparisons of early root cortical senescence between barley cultivars, *Triticum* species and other cereals, 495
LOUREIRO, M. F., JAMES, E. K., SPRENT, J. I. & FRANCO, A. A., Stem and root nodules on the tropical wetland legume *Aeschynomene fluminensis*, 531
MACLEOD, R. (see BAMBRIDGE, L.), 75
MANSFIELD, T. A. (see NEWBERY, R. M.), 565
MARSCHNER, H. (see VON WIRÉN, N.), 511
MERRYWEATHER, J. & FITTER, A., Errata. *The New Phytologist* **129** (1995), 619–627, 467
MERRYWEATHER, J. W. (see CLAPP, J. P.), 259
MIGHALL, T. M. & CHAMBERS, F. M., Holocene vegetation history and human impact at Bryn y Castell, Snowdonia, north Wales, 299
MIGNARD, E. (see RIGOU, L.), 141
MILLARD, P. (see THORNTON, B.), 557
MISZALSKI, Z. (see NIEWIADOMSKA, E.), 461
MOIROUD, A. (see SEQUERRA, J.), 545
NEO, H. H. (see CLIFFORD, P. E.), 381
NEUFELD, H. S., LEE, E. H., RENFRO, J. R., HACKER, W. D. & YU, B.-H., Sensitivity of seedlings of black cherry (*Prunus serotina* Ehrh.) to ozone in Great Smoky Mountains National Park. I. Exposure–response curves for biomass, 447

NEWBERY, R. M., WOLFENDEN, J., MANSFIELD, T. A. & HARRISON, A. F., Nitrogen, phosphorus and potassium uptake and demand in *Agrostis capillaris*: the influence of elevated CO_2 and nutrient supply, 565
NIEWIADOMSKA, E. & MISZALSKI, Z., Does CO_2 modify the effect of SO_2 on variegated leaves of *Chlorophytum comosum* (Thunb) Bak?, 461
NOBEL, P. S. (see NORTH, G. B.), 47
NORTH, G. B. & NOBEL, P. S., Hydraulic conductivity of concentric root tissues of *Agave deserti* Engelm. under wet and drying conditions, 47
OKSANEN, J. (see KAINULAINEN, P.), 231
OLESEN, T., Physiological responses of *Atherosperma moschatum* to day length, night length and photosynthetic photon fluence rate, 575
OLIVER, R. P. (see HOWLAND, D. E.), 117
PAGÈS, L., Growth patterns of the lateral roots of young oak (*Quercus robur*) tree seedlings. Relationship with apical diameter, 503
PARKER, J. S. (see BALUŠKA, F.), 177
PATIL, B. S., PIKE, L. K. & HAMILTON, B. K., Changes in quercetin concentration in onion (*Allium cepa* L.) owing to location, growth stage and soil type, 349
PAUL, N. D. (see HATCHER, P. E.), 239
PECCHIARI, M. (see TRETIACH, M.), 585
PELL, E. J., SINN, J. P. & VINTEN JOHANSEN, C., Nitrogen supply as a limiting factor determining the sensitivity to ozone stress of *Populus tremuloides* Michx., 437
PERCY, K. E. (see CAPE, J. N.), 157
PEROTTO, S. (see BONFANTE, P.), 3
PIKE, L. K. (see PATIL, B. S.), 349
PLASSARD, C. (see RIGOU, L.), 141
POLLOCK, C. J. (see CAIRNS, A. J.), 391
PRITCHARD, J. (see TRIBOULOT, M.-B.), 169
RAFAREL, C. R. (see ASHENDEN, T. W.), 89
READ, D. J. (see BENDING, G. D.), 401, 411
REIMANN, C. & BRECKLE, S.-W., Salt tolerance and ion relations of *Salsola kali* L.: differences between ssp. *tragus* (L.) Nyman and ssp. *ruthenica* (Iljin) Soó, 37
REMY, J. C. (see RIGOU, L.), 141
RENFRO, J. R. (see NEUFELD, H. S.), 447
REUZEAU, C. & CAVALIE, G., Activities of free radical processing enzymes in dry sunflower seeds, 59
RIDGE, I. (see DENNY, H. J.), 251
RIECHERS, G. H. (see TEMPLE, P. J.), 97
RIGOU, L., MIGNARD, E., PLASSARD, C., ARVIEU, J. C. & REMY, J. C., Influence of ectomycorrhizal infection on the rhizosphere pH around roots of maritime pine (*Pinus pinaster* Soland *in* Ait.), 141
RITCHIE, J. C., Tansley Review No. 83. Current trends in studies of long-term plant community dynamics, 469
ROHR, R. (see VIOUGEAS, M. A.), 337
RÖMHELD, V. (see VON WIRÉN, N.), 511
SAEED BHATTI, A. (see JESCHKE, W. D.), 23
SALZER, P. (see SIRRENBERG, A.), 149
SANDERMANN, H. Jr. (see SCHNEIDERBAUER, A.), 225
SANDERS, I. R., ALT, M., GROPPE, K., BOLLER, T. & WIEMKEN, A., Identification of ribosomal DNA polymorphisms among and within spores of the Glomales: application to studies on the genetic diversity of arbuscular mycorrhizal fungal communities, 419
SARWAR, G. (see JESCHKE, W. D.), 23
SCHNEIDERBAUER, A., BACK, E., SANDERMANN, H. Jr. & ERNST, D., Ozone induction of extensin mRNA in Scots pine, Norway spruce and European beech, 225
SEMPAVALAN, J., WHEELER, C. T. & HOOKER, J. E., Lack of competition between *Frankia* and *Glomus* for infection and colonization of roots of *Casuarina equisetifolia* (L.), 429
SEQUERRA, J., CAPELLANO, A., GIANINAZZI-PEARSON, V. & MOIROUD, A., Ultrastructure of cortical root cells of *Alnus incana* infected by *Pencillium nodositatum*, 545
SHIOIRI, T. (see VON WIRÉN, N.), 511
SINN, J. P. (see PELL, E. J.), 437
SIRRENBERG, A., SALZER, P. & HAGER, A., Induction of mycorrhiza-like structures and defence reactions in dual cultures of spruce callus and ectomycorrhizal fungi, 149
SPRENT, J. I. (see LOUREIRO, M. F.), 531
STODDART, J. L. (see THOMAS, H.), 125
TEMPLE, P. J. & RIECHERS, G. H., Nitrogen allocation in ponderosa pine seedlings exposed to interacting ozone and drought stress, 97
THOMAS, B. J. (see GORDON, A. J.), 523
THOMAS, H. & STODDART, J. L., Temperature sensitivities of *Festuca arundinacea* Schreb. and *Dactylis glomerata* L. ecotypes, 125
——, (see GAY, A. P.), 159
THORNTON, B., MILLARD, P. & TYLER, M. R., Effects of nitrogen supply on the seasonal re-mobilization of nitrogen in *Ulex europaeus*, 557
TOMOS, D. (see TRIBOULOT, M.-B.), 169
TOWNEND, J., Effects of elevated CO_2, water and nutrients on *Picea sitchensis* (Bong.) Carr. seedlings, 193
TRETIACH, M. & PECCHIARI, M., Gas exchange rates and chlorophyll content of epi- and endolithic lichens from the Trieste Karst (NE Italy), 585
TRIBOULOT, M.-B., PRITCHARD, J. & TOMOS, D., Stimulation and inhibition of pine root growth by osmotic stress, 169
TYLER, M. R. (see THORNTON, B.), 557
VAN OOSTEN, J.-J., WILKINS, D. & BESFORD, R. T., Acclimation of tomato to different carbon dioxide concentrations. Relationships between biochemistry and gas exchange during leaf development, 357
VAN VIERSSEN, W. (see CLEVERING, O. A.), 105
VINTEN JOHANSEN, C. (see PELL, E. J.), 437
VIOUGEAS, M. A., ROHR, R. & CHAMEL, A., Structural changes and permeability of ivy (*Hedera helix* L.) leaf cuticles in relation to leaf development and after selective chemical treatments, 337
VOLK, R. J. (see JACKSON, W. A.), 327
VOLKMANN, D. (see BALUŠKA, F.), 177
VON WIRÉN, N., RÖMHELD, V., SHIOIRI, T. & MARSCHNER, H., Competition between micro-organisms and roots of barley and sorghum for iron accumulated in the root apoplasm, 511
WHEELER, C. T. (see SEMPAVALAN, J.), 429
WIEMKEN, A. (see SANDERS, I. R.), 419
WILKINS, D. (see VAN OOSTEN, J.-J.), 357
WOLFENDEN, J. & DIGGLE, P. J., Canopy gas exchange and growth of upland pasture swards in elevated CO_2, 369
——, (see NEWBERY, R. M.), 565
YOUNG, I. M., Variation in moisture contents between bulk soil and the rhizosheath of wheat (*Triticum aestivum* L. cv. Wembley), 135
YOUNG, J. P. W. (see CLAPP, J. P.), 259
YU, B.-H. (see NEUFELD, H. S.), 447

Subject Index

Abscisic acid, 207
Acclimation, 575
Acclimation to high CO_2, 357
Acid mist, 89
Aeschynomene fluminensis, 531
Agrostis capillaris, 565
Allium cepa (onion), 349
Alnus incana, 545
AM fungi, 3
Ammonium uptake, 327
Anticarcinogen, 349
Apical diameter, 503
Apoplasmic root Fe, 511
Apoplast, 47
Aranda Noorah Alsagoff, 381
Arbuscular mycorrhizas, 259, 419
Aspen, 437
Assimilate partitioning, 381
Atherosperma moschatum (sassafras), 575
Axenic cultures, 267
Barley, 495
Betula (birch), 117
Biodiversity, 419
Bulk density, 135
$\delta^{13}C$, 585
Canopy photosynthesis, 369
Carbohydrates, 231
Carbon balance, 159
Casuarina equisetifolia, 429
Cations, 23
Cell cycle, 3
Cell doubling time, 75
Cell growth orientation, 177
Cell wall, 3
Cell wall loosening and tightening, 169
Cereals, 495
Chloride, 23
Chlorophyll content, 585
CO_2 stomata, 461
Cold-active, 391
Competition, 429, 503
Cortical cell infection, 545
Critical levels, 89
Critical loads, 89
Cryoprotectant, 391
Dactylis glomerata, 125
Degradative enzymes, 411
Diversity, 259
Drought, 193
Drought stress, 97
Dual culture, 149
Dynamics, 469
Ectomycorrhiza, 149
Ectomycorrhizal mycelium, 401, 411
Editorial changes, 1
Elevated CO_2, 193, 369
Emergent macrophytes, 105
Endolithic and epilithic lichens, 585
Enhanced CO_2, 565
Epicuticular wax morphology, 67
Ericaceous mycorrhizas, 251
Errata, 157, 467
Exodermis, 47
Extensin, 225
Festuca arundinacea, 125
Flow cytometry, 75
Foliar senescence, 97
Forest ecosystem, 411
Forest trees, 225
Frankia, 429
Fructan, 391
Fusarium nivale, 391
Gas exchange, 81, 585
Gaseous pollutants, 89
Gastrophysa viridula, 239
Germinability, 207
Germination ability, 59
Global change, 357
Glomus, 429
Grasslands, 369
Great Smoky Mountains National Park, 447
Growth, 437, 447, 503
Growth stage, 349
Hedera helix, 337
Helianthus annuus L. (sunflower), 59
Herbivory, 239
Holocene, 299
Hordeum vulgare (barley), 511
Host recognition, 149
Human impact, 299
Hyacinthoides non-scriptus, 259
Hybridization, 217
Hydrolytic enzymes, 3
Hypersensitive response, 149
Identification, 259
Immunogold labelling, 523
In vitro culture, 337
Induced resistance, 239
Internal transcribed-spacer, 419
Interphase, 75
Introgression, 217
Ion content, 37
Isolation success, 267
Isozymes, 217
K/Na-ratio, 37
Leaf cuticle, 337
Leaf growth, 159
Leaf growth and senescence, 125
Leguminosae, 557
Leptochloa fusca, 23
Lichen-forming fungi, 267
Lichenicolous fungi, 267
Lignin, 225
Lipid peroxidation, 59
Location, 349
Long-term, 469
Low temperature, 391
Lycopersicon esculentum, 357
Macrofossils, 469
Matric potential, 135
Maximum water depth, 105
Mechanical injury, 67
Metal tolerance, 251
Microfossils, 469
Micro-organisms, 511
Microtubules, 177
Mitotic index, 75
Moisture content, 135
Monopodial orchids, 381
Morphogenesis, 3
Morphometrics, 117
mRNA, 225
Myconodule, 545
N_2 fixation, 557
Net H^+ efflux, 141
Nitrate uptake, 327
Nitrogen, 401, 437, 557
Nitrogen fixation, 531
Nitrogen resorption, 97
Nitrogen suppression, 327
Nodules, 523
Nuclear sizes, 177

Nutrient cycling, 411
Nutrient uptake, 565
Nutrients, 193, 565
$O_2^{\cdot-}/H_2O_2$ scavenging enzymes, 59
Open top chamber, 81
Osmotic stress, 169
Oxygen, 531
Ozone, 75, 225, 437, 447
Ozone injury, 97
PAR-climate, 575
PCR, 259
PCR-RFLP, 419
Penicillium nodositatum, 545
Permeability, 337
pH dye indicator, 141
Phloem and xylem transport, 23
Phosphorus, 401
Photosynthesis, 81, 105, 159, 357, 461
Phytosiderophores, 511
Picea abies, 67, 81, 231
Picea sitchensis, 193
Pinus pinaster, 141, 169
Pinus sylvestris L., 231
Plant community, 469
Plastochron, 159
Pollen analysis, 299
Polygala, 217
Polymorphism, 117
Ponderosa pine (*Pinus ponderosa*), 97
Potassium nutrition, 207
Productivity, 369
Prunus serotina, 447
Q_{10}, 125
Quercetin, 349
RAPDs, 117
rDNA, 117
Re-crystallization of wax tubes, 67
Relationships, 217
Re-mobilization, 557
Reserve carbohydrates, 105
Respiration, 369
Rhizosheath, 135
Rhizosphere pH, 141
Ribosomal DNA, 419
Root bioassay, 565
Root cell cycle, 177
Root cortex, 47
Root cortical death, 495
Root growth, 169
Root mucilage, 135
Root system, 503
Roots, 429
Rubisco, 357
Rumex spp., 239
Rust infection structures, 239
Salsola kali, 37
Salt tolerance, 37
Secondary compounds, 231
Secretion, 23
Seed ageing, 59
Seed development, 207
Senescence, 159, 437, 495
Sink strength, 503
Slime, 251
SO_2, 461
Soil organic matter, 401
Sorghum bicolor, 207, 511
Source–sink relationship, 381
Stem nodules, 531
Storage artefacts, 67
Suberin, 47
Submerged growth, 105
Succulence, 37
Sucrose synthase, 523
Suillus collinitus, 141
Sulphur dioxide, 231
Superoxide dismutase, 461
Thermal response, 125
Translocation, 401
Transpiration, 81
Trieste Karst, 585
Triticum spp., 495
Turgor pressure, 169
Ulex europaeus (gorse), 557
Ultrastructure, 337, 545
Uromyces rumicis, 239
Vegetational history, 299
Wales, 299
Water uptake, 47
Weibull response function, 447
Wetlands, 531
White clover, 89, 523
Zea may L., 327
Zinc toxicity, 251